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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/787,972	01/17/2002	Robert Selfridge	T7029CIPPCT.US	9911

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EXAMINER	
LEE, PING	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/787,972	SELFRIDGE ET AL.	
	Examiner	Art Unit	
	Ping Lee	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-118* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,8,11,12,16,17,19-22,24-31,34,35,39,40,43-49,51,79,82,83,85,86 and 91-93* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/31/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 5,6,9,10,13-15,18,23,32,33,36-38,41,42,50,52-78,80,81,84,87-90 and 94-118.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species 2 in the reply filed on 2/16/06 is acknowledged.

2. Claims 5, 6, 9, 10, 13-15, 18, 23, 32, 33, 36-38, 41, 42, 50, 52-78, 80, 81, 84, 87-90 and 94-118 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 2/16/06.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, 19, 21, 24, 26-30, 79, 82, 83, 85, 86, 91 and 92 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al (US 4,823,908).

Regarding claims 1 and 3, Tanaka et al (hereafter Tanaka) disclose a method for generating parametric audio output based on interaction of multiple ultrasonic frequencies within air as a nonlinear medium, said method comprising the steps of:

a) generating (by 6 as shown in Fig. 2) an electronic signal comprising at least two ultrasonic signals having a difference in value which falls within an audio frequency range (col. 2, lines 34-43);

b) transferring the electronic signal to an electro acoustical film transducer diaphragm (8) which couples directly with the air as part of a single stage energy conversion process (see Fig. 2);

c) converting the electronic signal at the diaphragm directly to mechanical displacement as a driver member of a parametric speaker (col. 4, line 29 and 44-45); and

d) mechanically emitting the at least two ultrasonic signals from the diaphragm into the air as ultrasonic compression waves which interact within the air to generate the parametric audio output (col. 2, lines 39-42).

Regarding claims 19 and 21, Tanaka further shows the supporting structure (as shown in Fig. 5 to support element 8).

Regarding claims 24 and 26-29, as shown in Fig. 22, the diaphragm is formed by an array of arcuate emitter sections (each ultrasonic wave radiator 30 will be curved with the applied voltage).

Regarding claim 30, Tanaka shows in Fig. 23 the elongate, channel-shaped indentation.

Regarding claims 79, 82, 83, 85, 86, 91 and 92, Tanaka shows in Fig. 23 the support plate (32) and a thin piezoelectric film (form on 30) having ultrasonic emitter array (as shown in Fig. 27).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 2, 4, 11, 12, 20, 22, 34, 35, 46, 48, 49 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Schindel et al (US 5,287,331).

Regarding claims 2 and 20, Tanaka fails to explicitly show an electrostatic transducer. Tanaka teaches an ultrasonic generator using a piezoelectric vibrator

without specifying the particular structure. One skilled in the art would have expected that any specify design of the ultrasonic transducer could be used without generating any unexpected result.

Schindel et al (hereafter Schindel) teaches how to use a piezoelectric film (col. 3, lines 67-68) electrostatic transducer with a backplate (1) for generating ultrasonic signals. Thus, it would have been obvious to one of ordinary skill in the ad to modify Tanaka in view of Schindel by using the piezoelectric film electrostatic transducer in order to generate the ultrasonic signals.

Regarding claims 4 and 22, Schindel teaches the thermal formed electro mechanical film diaphragm (col. 4, line 1).

Regarding claims 11, 12, 34 and 35, Schindel fails to show the dimension of the diaphragm is related to the wavelength of the lowest ultrasonic frequency. It was well known in the art that the frequency of a signal is inversely related to its wavelength. Therefore, it would have been obvious to one of ordinary skill in the art to select a diaphragm dimension greater than the lowest ultrasonic frequency or ten times greater than the lowest ultrasonic frequency to ensure that the lowest ultrasonic frequency would be produced properly.

Regarding claims 46-49 and 51, Schindel teaches the aligned cavities.

Regarding claim 93, although Schindel and Tanaka respectively fail to show diaphragm used PVDF, PVDF was a well known material for making piezoelectric film.

9. Claims 4, 7, 8, 16, 17, 25, 31, 39, 40, 46, 48, 49, 51 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Tibbetts et al (US 4,056,742).

Regarding claims 4, 7, 8, 31, 46, 48, 49 and 51, Tanaka fails to show thermally formed film diaphragm transducer. Tanaka teaches an ultrasonic generator using a piezoelectric vibrator without specifying the particular structure. One skilled in the art would have expected that any specify design of the ultrasonic transducer could be used without generating any unexpected result. Tibbetts et al (hereafter Tibbetts) teaches how to use a piezoelectric film (col. 3, lines 67-68) transducer with a backplate (1) for generating ultrasonic signals. As shown in the drawings, Tibbetts suggested the curvature for both the film and the backplate. Although Tibbetts fails to show that the film is thermally formed, it was well known in the art to use heat to alter the shape of the film. Thus, it would have been obvious to one of ordinary skill in the art to modify Tanaka in view of Tibbetts by using the piezoelectric film transducer as taught in Tibbetts in order to generate the ultrasonic signals.

Regarding claims 25 and 43-45, Tibbetts teaches that the particular layout is used to reduce the distortion (see abstract). Tanaka teaches that the sound pressure level is less than 140 dB (col. 7, lines 3-5).

Regarding claims 16,17, 39 and 40, although Tibbetts fails to explicitly show the distance between the film and the supporting plate is one-quarter wavelength, this is an inherent feature to ensure that the piezo film to operate properly.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 571-272-7522. The examiner can normally be reached on Monday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ping Lee
Primary Examiner
Art Unit 2644

pwl